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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,538	08/21/2008	Chihaya Adachi	AI 421NP	1638
23995 7590 04/02/2010				
RABIN & Berdo, PC 1101 14TH STREET, NW SUITE 500 WASHINGTON, DC 20005				
EXAMINER				
YUSHIN, NIKOLAY K				
ART UNIT		PAPER NUMBER		
2893				
MAIL DATE		DELIVERY MODE		
04/02/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/586,538

**Applicant(s)**

ADACHI ET AL.

**Examiner**

NIKOLAY YUSHIN

**Art Unit**

2893

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-9 and 12-18 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 10, 11, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS-08)  
Paper No(s)/Mail Date 07/19/2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

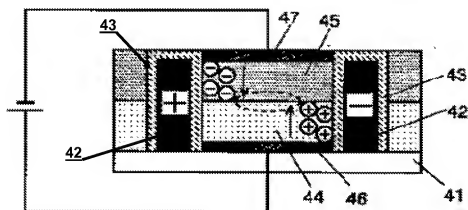
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1–8 and 12–16 are rejected under 35 U.S.C. 102(b) as being anticipated by Masayaki et al., JP 2003-282884.

In re Claim 1, Masayaki discloses a organic semiconductor device (Fig. A below)), comprising: a bipolar organic semiconductor layer (44, 45) in which electrons and holes are movable; a hole giving/receiving electrode 46 for giving/receiving holes (shown by +) to/from the organic semiconductor layer (44, 45); an electron giving/receiving electrode 47, spaced a predetermined distance from the hole giving/receiving electrode 46, for giving/receiving electrons (shown by -) to/from the organic semiconductor layer (44, 45); a hole-side gate electrode (42, right), arranged opposing to a region of the organic semiconductor layer (44, 45) near the hole giving/receiving electrode 46 with an insulating layer 43 sandwiched, for controlling distribution of holes (shown by +) in the organic semiconductor layer (44, 45); and an electron-side gate electrode (42, left), arranged opposing to a region of the organic semiconductor layer (44, 45) near the electron giving/receiving electrode 47) with an insulating layer (43, left) sandwiched, for controlling distribution of electrons (shown by -) in the organic semiconductor layer (44, 45) (Fig. A; [0021 – 0023]).

The limitations “for giving/receiving holes/electrons and for controlling distribution of holes/electrons” are functional in that it attempts to define the claimed structure “by what it does rather than what it is.” *Halliburton Energy Services Inc. v. M-I LLC*, 85 USPQ2d 1654, 1662 (Fed. Cir. 2008), citing *In re Swinehart*, 439 F.2d 210 (CCPA 1971). When a claim limitation is defined in purely functional language, applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See MPEP § 2114. In the case at hand, Applicant explains in his specification that certain structures are capable of performing the recited function. Because of the close structural similarity between these structures and those of the prior art device, the prior art device is apparently reasonably capable of performing the recited function. Applicant should, in his response, provide evidence that the prior art is incapable of performing the recited function, if such evidence is available. Note that an allegation that those skilled in the art were unaware that the prior art structure was inherently capable of performing the recited function is legally insufficient to show that the prior art lacks the inherent capability. See MPEP § 2112, part III (“There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure *at the time of invention*, but only that the subject matter is in fact inherent in the prior art reference”). Note that because the only issue is whether the functional limitation is in fact inherent in the prior art reference, an applicant’s explanation (and in fact any such explanation, made at any time, by anyone) of a given structure’s ability to perform the recited function is available as evidence of that structure’s inherent capability to meet the functional limitation.



Drawing 4 of Masayaki

In re Claim 2, Masayaki discloses that the organic semiconductor layer (44, 45) is formed of a bipolar organic semiconductor material (Drawing 4; [0023]).

In re Claim 3, Masayaki discloses that the organic semiconductor layer (44, 45) includes a laminated structural film with an N-type organic semiconductor layer 44 and a P-type organic semiconductor layer 45 laminated with each other (Drawing 4; [0023]).

In re Claim 4, Masayaki discloses that the organic semiconductor layer (44, 45) has a junction film structure including an N-type organic semiconductor layer 44 and a P-type organic semiconductor layer 45 having a junction portion between the hole giving/receiving electrode 46 layer and the electron giving/receiving electrode layer 47 (Drawing 4; [0021- 0023]).

In re Claim 5, Masayaki discloses that the organic semiconductor layer is formed of a mixture of an N-type organic semiconductor material and a P-type organic semiconductor material ([0023]).

In re Claim 6, Masayaki discloses that the hole giving/receiving electrode 46 is an hole injecting electrode for injecting holes (shown by +) into the organic semiconductor layer (44, 45), and the electron giving/receiving electrode 47 is an electron injecting electrode for injecting electrons (shown by -) into the organic semiconductor layer (44, 45) (Drawing 4; [0021 -0023]).

The limitations “for injection holes/electrons” are functional in that it attempts to define the claimed structure “by what it does rather than what it is.” *Halliburton Energy Services Inc. v. M-I LLC*, 85 USPQ2d 1654, 1662 (Fed. Cir. 2008), citing *In re Swinehart*, 439 F.2d 210 (CCPA 1971). When a claim limitation is defined in purely functional language, applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See MPEP § 2114. In the case at hand, Applicant explains in his specification that certain structures are capable of performing the recited function. Because of the close structural similarity between these structures and those of the prior art device, the prior art device is apparently reasonably capable of performing the recited function. Applicant should, in his response, provide evidence that the prior art is incapable of performing the recited function, if such evidence is available. Note that an allegation that those skilled in the art were unaware that the prior art structure was inherently capable of performing the recited function is legally insufficient to show that the prior art lacks the inherent capability. See MPEP § 2112, part III (“There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure *at the time of invention*, but only that the subject matter is in

fact inherent in the prior art reference”). Note that because the only issue is whether the functional limitation is in fact inherent in the prior art reference, an applicant’s explanation (and in fact any such explanation, made at any time, by anyone) of a given structure’s ability to perform the recited function is available as evidence of that structure’s inherent capability to meet the functional limitation.

In re Claim 7, Masayaki discloses that the organic semiconductor layer (44, 45) is an organic semiconductor light emitting layer that emits light by recombination of holes (shown by +) and electrons (shown by -) in the layer (44, 45) (Drawing 4; Abstract, claim 3, [0019]).

The limitation “that emits light” is functional in that it attempts to define the claimed structure “by what it does rather than what it is.” *Halliburton Energy Services Inc. v. M-I LLC*, 85 USPQ2d 1654, 1662 (Fed. Cir. 2008), citing *In re Swinehart*, 439 F.2d 210 (CCPA 1971). When a claim limitation is defined in purely functional language, applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See MPEP § 2114. In the case at hand, Applicant explains in his specification that certain structures are capable of performing the recited function. Because of the close structural similarity between these structures and those of the prior art device, the prior art device is apparently reasonably capable of performing the recited function. Applicant should, in his response, provide evidence that the prior art is incapable of performing the recited function, if such evidence is available. Note that an allegation that those skilled in the art were unaware that the prior art structure was inherently capable of performing the recited function is legally insufficient to show that the prior art lacks the inherent capability. See MPEP

§ 2112, part III (“There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure *at the time of invention*, but only that the subject matter is in fact inherent in the prior art reference”). Note that because the only issue is whether the functional limitation is in fact inherent in the prior art reference, an applicant’s explanation (and in fact any such explanation, made at any time, by anyone) of a given structure's ability to perform the recited function is available as evidence of that structure's inherent capability to meet the functional limitation.

In re Claim 8, Masayaki discloses that a control circuit that independently applies control voltages to the hole-side gate electrode (42, right) and the electron-side gate electrode (42, left) (Drawings 4 and 10; [0019]).

In re Claim 12, Masayaki discloses that the hole giving/receiving electrode 46 is an hole injecting electrode for injecting holes (shown by +) into the organic semiconductor layer (44, 45), and the electron giving/receiving electrode 47 is an electron injecting electrode for injecting electrons (shown by -) into the organic semiconductor layer (44, 45) (Drawing 4, [0022]).

The limitation “for injecting electrons” is functional in that it attempts to define the claimed structure “by what it does rather than what it is.” *Halliburton Energy Services Inc. v. M-LLC*, 85 USPQ2d 1654, 1662 (Fed. Cir. 2008), citing *In re Swinehart*, 439 F.2d 210 (CCPA 1971). When a claim limitation is defined in purely functional language, applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See MPEP § 2114. In the case at hand, Applicant

explains in his specification that certain structures are capable of performing the recited function. Because of the close structural similarity between these structures and those of the prior art device, the prior art device is apparently reasonably capable of performing the recited function. Applicant should, in his response, provide evidence that the prior art is incapable of performing the recited function, if such evidence is available. Note that an allegation that those skilled in the art were unaware that the prior art structure was inherently capable of performing the recited function is legally insufficient to show that the prior art lacks the inherent capability. See MPEP § 2112, part III (“There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure *at the time of invention*, but only that the subject matter is in fact inherent in the prior art reference”). Note that because the only issue is whether the functional limitation is in fact inherent in the prior art reference, an applicant’s explanation (and in fact any such explanation, made at any time, by anyone) of a given structure’s ability to perform the recited function is available as evidence of that structure’s inherent capability to meet the functional limitation.

In re Claim 13, Masayaki discloses that the hole giving/receiving electrode 48 is an hole injecting electrode for injecting holes (shown by +) into the organic semiconductor layer (44, 45), and the electron giving/receiving electrode 47 is an electron injecting electrode for injecting electrons (shown by -) into the organic semiconductor layer (44, 45) (Drawing 4; [0022]).

The limitation “for injecting electrons” is functional in that it attempts to define the claimed structure “by what it does rather than what it is.” *Halliburton Energy Services Inc. v. M-I LLC*, 85 USPQ2d 1654, 1662 (Fed. Cir. 2008), citing *In re Swinehart*, 439 F.2d 210 (CCPA

1971). When a claim limitation is defined in purely functional language, applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See MPEP § 2114. In the case at hand, Applicant explains in his specification that certain structures are capable of performing the recited function. Because of the close structural similarity between these structures and those of the prior art device, the prior art device is apparently reasonably capable of performing the recited function. Applicant should, in his response, provide evidence that the prior art is incapable of performing the recited function, if such evidence is available. Note that an allegation that those skilled in the art were unaware that the prior art structure was inherently capable of performing the recited function is legally insufficient to show that the prior art lacks the inherent capability. See MPEP § 2112, part III (“There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure *at the time of invention*, but only that the subject matter is in fact inherent in the prior art reference”). Note that because the only issue is whether the functional limitation is in fact inherent in the prior art reference, an applicant’s explanation (and in fact any such explanation, made at any time, by anyone) of a given structure’s ability to perform the recited function is available as evidence of that structure’s inherent capability to meet the functional limitation.

In re Claim 14, Masayaki discloses that the hole giving/receiving electrode 48 is an hole injecting electrode for injecting holes (shown by +) into the organic semiconductor layer (44, 45), and the electron giving/receiving electrode 47 is an electron injecting electrode for injecting electrons (shown by -) into the organic semiconductor layer (44, 45) (Drawing 4; [0022]).

The limitations “for injection holes/electrons” are functional in that it attempts to define the claimed structure “by what it does rather than what it is.” *Halliburton Energy Services Inc. v. M-I LLC*, 85 USPQ2d 1654, 1662 (Fed. Cir. 2008), citing *In re Swinehart*, 439 F.2d 210 (CCPA 1971). When a claim limitation is defined in purely functional language, applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See MPEP § 2114. In the case at hand, Applicant explains in his specification that certain structures are capable of performing the recited function. Because of the close structural similarity between these structures and those of the prior art device, the prior art device is apparently reasonably capable of performing the recited function. Applicant should, in his response, provide evidence that the prior art is incapable of performing the recited function, if such evidence is available. Note that an allegation that those skilled in the art were unaware that the prior art structure was inherently capable of performing the recited function is legally insufficient to show that the prior art lacks the inherent capability. See MPEP § 2112, part III (“There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure *at the time of invention*, but only that the subject matter is in fact inherent in the prior art reference”). Note that because the only issue is whether the functional limitation is in fact inherent in the prior art reference, an applicant’s explanation (and in fact any such explanation, made at any time, by anyone) of a given structure’s ability to perform the recited function is available as evidence of that structure’s inherent capability to meet the functional limitation.

In re Claim 15, Masayaki discloses that the hole giving/receiving electrode 48 is an hole injecting electrode for injecting holes (shown by +) into the organic semiconductor layer (44, 45), and the electron giving/receiving electrode 47 is an electron injecting electrode for injecting electrons (shown by -) into the organic semiconductor layer (44, 45) (Drawing 4; [0022]).

The limitations “for injection holes/electrons” are functional in that it attempts to define the claimed structure “by what it does rather than what it is.” *Halliburton Energy Services Inc. v. M-I LLC*, 85 USPQ2d 1654, 1662 (Fed. Cir. 2008), citing *In re Swinehart*, 439 F.2d 210 (CCPA 1971). When a claim limitation is defined in purely functional language, applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See MPEP § 2114. In the case at hand, Applicant explains in his specification that certain structures are capable of performing the recited function. Because of the close structural similarity between these structures and those of the prior art device, the prior art device is apparently reasonably capable of performing the recited function. Applicant should, in his response, provide evidence that the prior art is incapable of performing the recited function, if such evidence is available. Note that an allegation that those skilled in the art were unaware that the prior art structure was inherently capable of performing the recited function is legally insufficient to show that the prior art lacks the inherent capability. See MPEP § 2112, part III (“There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure *at the time of invention*, but only that the subject matter is in fact inherent in the prior art reference”). Note that because the only issue is whether the functional limitation is in fact inherent in the prior art reference, an applicant’s explanation (and in fact any such explanation, made at any time, by anyone) of a given structure’s ability to

perform the recited function is available as evidence of that structure's inherent capability to meet the functional limitation.

In re Claim 16, Masayaki discloses that a control circuit that independently applies control voltages to the hole-side gate electrode (42, right) and the electron-side gate electrode (42, left) (Drawings 4 and 10; [0019]).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masayaki.

In re Claim 9, Masayaki discloses all limitations of claim 9 including that the semiconductor device arranged on a substrate 41 (Drawing 4). However, Masayaki does not disclose a plurality of devices.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a plurality of semiconductor devices, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

In re Claim 17, Masayaki discloses all limitations of claim 17 including that the semiconductor device arranged on a substrate 41 (Drawing 4). However, Masayaki does not disclose a plurality of the devices.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a plurality of semiconductor devices, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

In re Claim 18, Masayaki discloses all limitations of claim 17 including that the semiconductor device arranged on a substrate 41 (Drawing 4). However, Masayaki does not disclose a plurality of the devices.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a plurality of semiconductor devices, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

#### ***Allowable Subject Matter***

Claims 10, 11, 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NIKOLAY YUSHIN whose telephone number is (571) 270-

7885. The examiner can normally be reached on Monday through Thursday from 8 a.m. to 5 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Davienne Monbleau can be reached on 571-272-1945. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NIKOLAY YUSHIN/  
Examiner, Art Unit 2893

/Thomas L Dickey/  
Primary Examiner, Art Unit 2826

